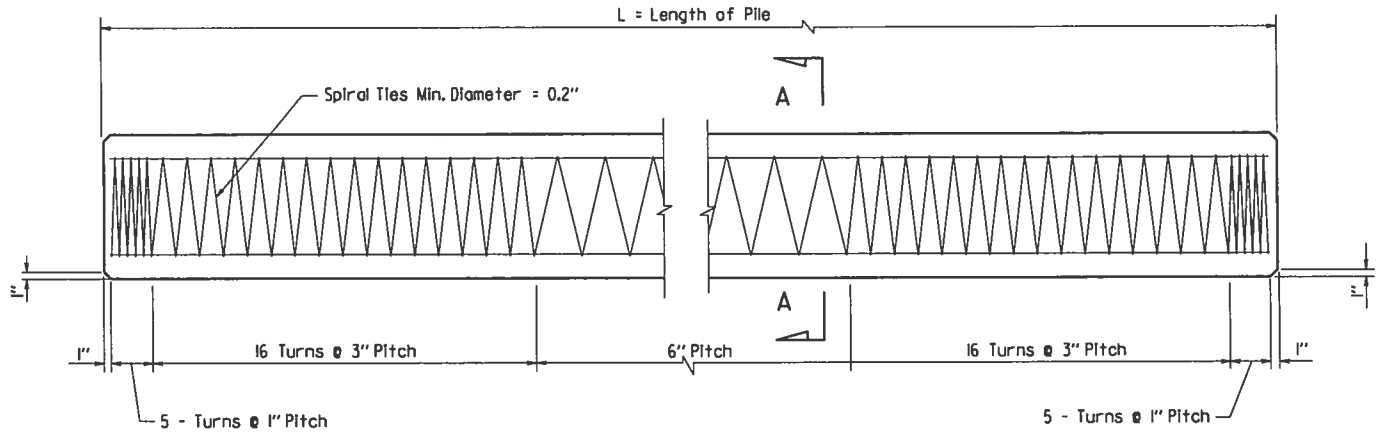
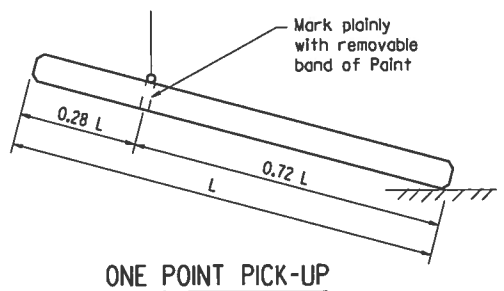
| DATE REVISED | DATE FILMED | DATE REVISED | DATE FILMED | FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | ARK. | | | |
| | | | | JOB NO. | | | | |
| | | | | ① | CONC. PILES | | | 55024 |



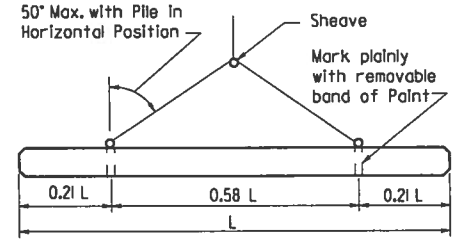

PLAN OF PILE SHOWING SPIRAL TIE SPACING

## MAXIMUM PICKUP LENGTHS L

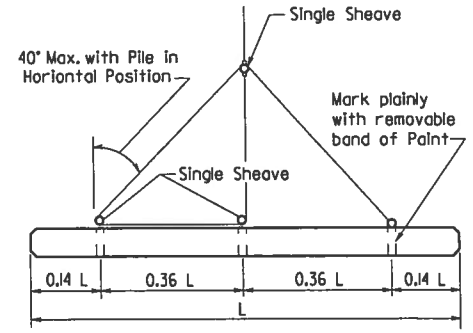
| Type of Pick - Up | Prestressed | | Precast | Prestressed | | | Precast | | |
|---|---|---|---|---|---|---|---|---|---|
| | 16" Oct. | 18" Oct. | 16" or 18" Oct. | 14" Sq. | 16" Sq. | 18" Sq. | 14" Sq. | 16" Sq. | 18" Sq. |
| One - Point | 52' | 55' | 46' | 55' | 59' | 63' | 52' | 51' | 55' |
| Two - Point | 75' | 80' | 67' | 79' | 84' | 90' | 75' | 74' | 79' |
| Three - Point | 105' | 112' | 93' | 110' | 117' | 126' | 104' | 103' | 111' |




ONE POINT PICK-UP

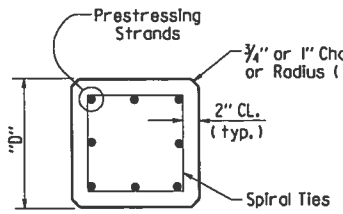



TWO POINT PICK-UP

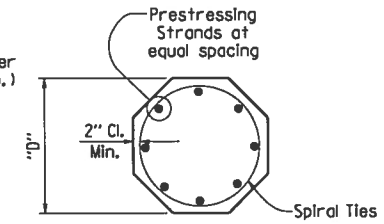



THREE POINT PICK-UP

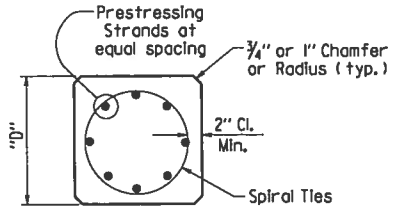
Note : Strand location shall be symmetrical about the axis of the pile with no more than one strand difference between any two adjacent sides. Circular spiral ties are required for odd number of strands.




SECTION A-A SQUARE PILE




SECTION A-A OCTAGONAL PILE

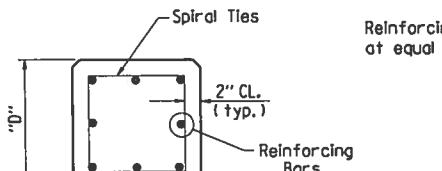



SECTION A-A SQUARE PILE

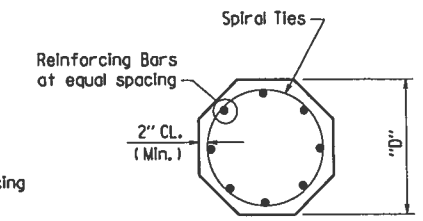
PRESTRESSED CONCRETE PILES

## PRECAST PILE REINFORCING

| Pile Size | No. Req'd. | Bar Size |
|---|---|---|
| 16" Oct. | 8 | # 7 |
| 18" Oct. | 8 | # 7 |
| 14" Sq. | 8 | # 7 |
| 16" Sq. | 8 | # 7 |
| 18" Sq. | 8 | # 8 |
| | | |




SECTION A-A SQUARE PILE




SECTION A-A OCTAGONAL PILE

PRECAST CONCRETE PILES

## PRESTRESSED PILE PROPERTIES

| | Grade | Strand Diameter | *Number of Strands per Size "D" | | | | | Minimum Ultimate Tensile Strength Per Strand (Lbs.) | Intial Prestressing Force Per Strand (Lbs.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 16" Oct. | 18" Oct. | 14" Sq. | 16" Sq. | 18" Sq. | | |
| Stress Relieved | 250 | 7/16" | 11 | 13 | 10 | 12 | 16 | 27,000 | 18,900 |
| | | 1/2" | 8 | 10 | 8 | 10 | 12 | 36,000 | 25,200 |
| | 270 | 7/16" | 9 | 11 | 8 | 12 | 14 | 31,000 | 21,700 |
| | | 1/2" | 7 | 9 | 6 | 8 | 10 | 41,300 | 28,900 |
| Low Relaxation | 250 | 7/16" | 9 | 11 | 8 | 11 | 13 | 27,000 | 20,200 |
| | | 1/2" | 7 | 8 | 6 | 8 | 10 | 36,000 | 27,000 |
| | 270 | 7/16" | 8 | 10 | 7 | 9 | 11 | 31,000 | 23,300 |
| | | 1/2" | 6 | 7 | 5 | 7 | 9 | 41,300 | 31,000 |

* Number based on initial presstress force of "B" x Ultimate Tensile Stress, Prestress Losses, and min. 700 psi Unit Prestress on concrete after Losses.

"B" — 0.75 Low Relaxation
0.70 Stress - Relieved

GENERAL NOTES

Construction Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 edition) with applicable Supplemental Specifications and Special Provisions. Unless otherwise noted, references to Section and Subsection numbers in the plans refer to the Construction Specifications.

Design Specification: AASHTO Standard Specifications for Highway Construction (2002 Edition), with Interim Specifications.

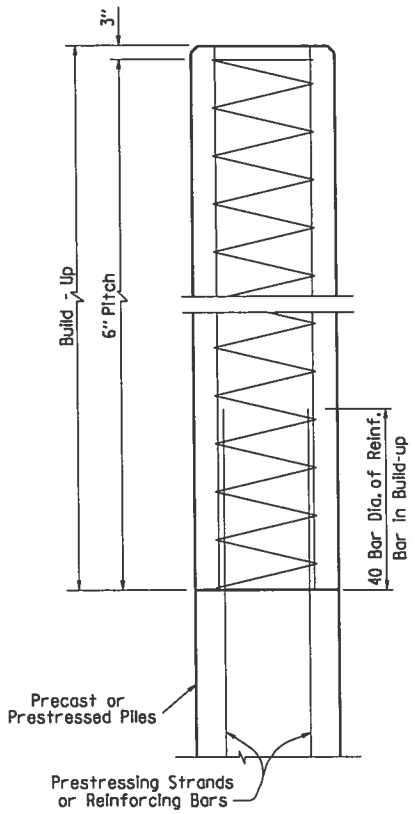
Concrete: Concrete in the Precast Prestressed Piles shall be Class S(AE) and shall have a Minimum Compressive Strength (f'c) of 5000 psi at 28 days. Compressive Strength at transfer of the Prestressing Force shall be not less than 4000 psi. Concrete in Build-Ups shall have a minimum Compressive Strength (f'c) of 4000 psi.

Prestressing Reinforcement: Seven wire stress relieved or low relaxation strands shall conform to the general requirements of AASHTO M203. Broken wires within individual strands will be permitted up to 2 % of the total number of wires in each pile, providing that there is not more than one broken wire per strand. Two or more broken wires per strand will be cause for replacement of the strand, even though the two broken wires are within the 2 % limitation.

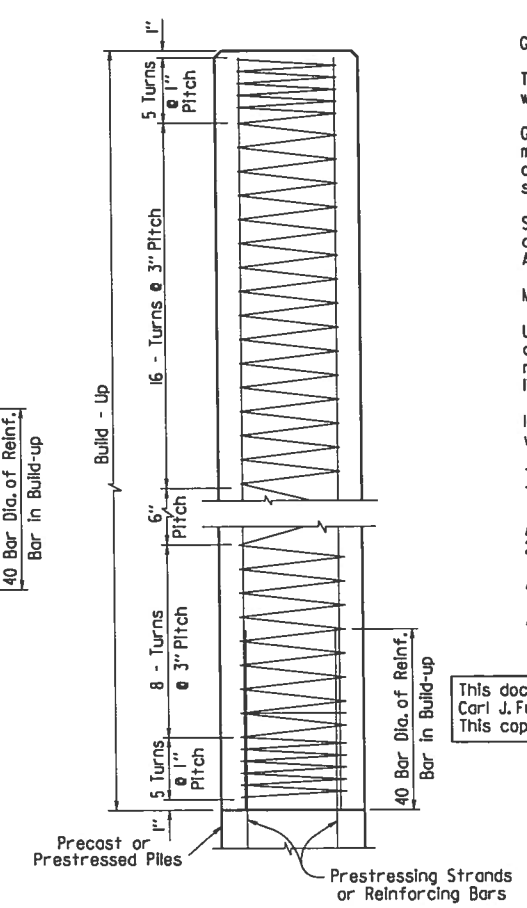
Build-Ups: To provide for Build-Ups of Piles where authorized by the Engineer, concrete shall be cut back to expose the strands for a distance sufficient to provide a lap of 40 diameters of the reinforcing bars required for Build-Up. Reinforcing of Build-Ups shall have a minimum area equal to 1½ % of the gross section of pile. Placement of bars shall be in a symmetrical pattern of not less than four bars. See Subsection 805.11(b).

Forms: For forming exterior of piles, the use of steel forms on concrete founded casting beds is required, unless otherwise approved by the Engineer. Side forms may have a maximum drift on each side not exceeding 1/4" per foot.

Tolerances: Pile ends shall be plane surfaces and perpendicular to axis of pile with a maximum tolerance of 1/8" per foot transversely.




BUILD - UP WITHOUT DRIVING




BUILD - UP WITH DRIVING

## PRECAST CONCRETE PILES

GENERAL NOTES

The maximum sweep (deviation from straightness measured along two perpendicular faces of the pile, while not subject to bending forces) shall not exceed 1/8" in 10 ft. of its length.

General: Shipment of piles from the plant site or pile driving will not be permitted until the required minimum compressive strength is reached, and in no case less than 10 days after pouring the concrete. Piles may be removed from casting bed to a nearby storage any time after transfer of stress.

Spiral Reinforcing: Spiral reinforcing shall be steel wire meeting the requirements of AASHTO M32 with a minimum diameter of 0.2" or shall be plain round steel bars meeting the requirements of Grade 60, AASHTO M31 or M322, Type A with a minimum diameter of 0.25".

Manufacture, Transportation and Storage: See Section 802 "Concrete for Structures".

Unless otherwise approved by the Engineer, all protruding or exposed pile lifting or transporting devices above the finished ground shall be removed after pile driving is complete. Removal shall be a minimum of 1" below the surface of the pile and the cavity shall be filled with a non-shrink grout listed on the Department's QPL.

Installation, Measurement and Payment: See Section 805 "Piling". Precast Prestressed Concrete Piling will be paid for at the contract unit price per Linear Foot bid for "Concrete Piling".

The Contractor may elect to use a Precast Concrete Pile in lieu of the Prestressed Concrete Pile. The following notes apply to Precast Concrete Piles:

All concrete shall be Class S (AE) and shall have a minimum compressive strength (f'c) of 4000 psi at 28 days.

All longitudinal reinforcing bars shall be deformed bars of Grade 60, AASHTO M31 or M322, Type A.

All spiral reinforcing shall be the same as that shown for prestressed concrete.

This document was originally issued and sealed by Carl J. Fuselier, PE No. 7510, on February 27, 2014. This copy is not a signed and sealed document.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL J. FUSELIER

BRIDGE ENGINEER

# STANDARD DETAILS FOR CONCRETE PILES (LOAD FACTOR DESIGN)

## ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55024.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: -

DRAWING NO. 55024